PROMINENT PRE-ENGINEERED SYSTEM

P/N: 7746432-0-701

2 COUPON RACK 1” PVC OPTION 1 WITH DOLE VALVE

PIPING COMPONENTS

ASAHI PVC/EPDM OMNI BALL VALVES
SPEARS PVC/EPDM LAB BALL VALVES
HAYWARD CLEAR PVC/VITON Y-STRAINER
METAL SAMPLES PVC/NYLON COUPN HOLDER
SPEARS SCH.80 PVC PIPING & FITTINGS
1” BRASS 5 GPM DOLE VALVE

Omni® Ball Valve

Specifications

Sizes: 3/8" – 3"
Models: Socket and Threaded
Bodies: PVC, CPVC
Seats: PTFE backed with EPDM
Seals: EPDM

Sizes 3/8" - 3" PVC/EPDM Models available with NSF-61 Certification

Omni® is a Trademark of Asahi/America, Inc.

Standard Features (Sizes 3/8" – 3")

- Blocks in two directions
- Rugged structure
- Unibody construction
- Compact, low profile, short face-to-face dimensions
- PTFE seat backed by EPDM for low stem torque
- Rated for full vacuum service

Options

- FKM backing cushions and O-ring
- Electrically actuated

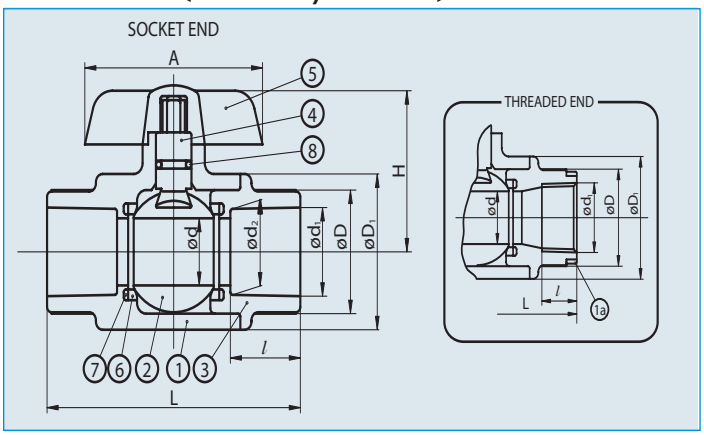
Pressure vs. Temperature (PSI, WATER, NON-SHOCK)

NOMINAL SIZE		PVC	CPVC			
		30° F 120° F	30° F 120° F	121° F 140° F	141° F 175° F	176° F 195° F
INCHES	mm					
3/8-2	13-50	150	150	120	90	60
3	80	150	150	120	90	60

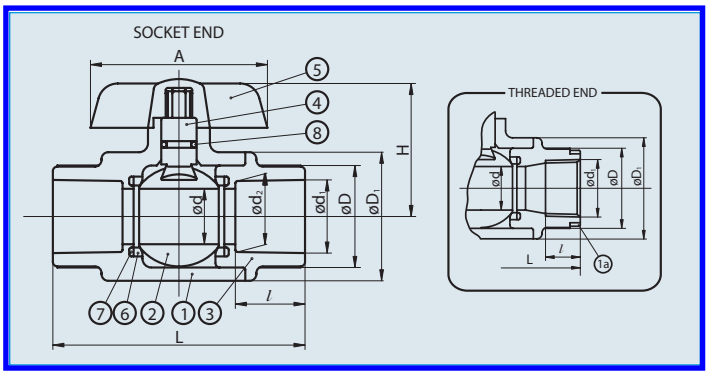
Sample Specification

All OMNI® ball valves size 3/8"- 3" shall be of one-piece compact design non-union type. All O-rings shall be EPDM or FKM with PTFE seats. Seats must have elastomeric backing cushions of the same material as the valve seals. PVC conforming to ASTM D1784 Cell Classification 12454-A, and CPVC conforming to ASTM D1784 Cell Classification 23567-A. Valve shall be rated 150 psi at 70°F, as manufactured by Asahi-America, Inc.

Parts List (Sizes 3/8"– 3")



*Used for CPVC body, threaded end, 1/2"–1"



Dimensions (Sizes 3/8" – 3")

NOMINAL SIZE		SOCKET ASTM SCH 40				THREADED							
INCHES	mm	d1	d2	l	L	d1	l	L	d	A	D	D1	h
3/8	13	0.687	0.671	0.59	3.35	3/8-18 NPT	0.59	3.35	0.51	2.36	1.22	1.38	1.65
1/2	15	0.848	0.836	0.69	3.82	1/2-14 NPT	0.59	3.82	0.59	2.76	1.22	1.38	1.73
3/4	20	1.058	1.046	0.72	4.02	3/4-14 NPT	0.67	4.06	0.79	3.15	1.46	2.17	2.17
1	25	1.325	1.310	0.87	4.49	1-11 1/2 NPT	0.79	4.45	0.98	3.15	1.77	2.36	2.36
1 1/4	32	1.670	1.655	0.94	5.00	1 1/4-11 1/2 NPT	0.87	5.00	1.22	3.74	2.13	2.76	2.76
1 1/2	40	1.912	1.894	1.09	5.98	1 1/2-11 1/2 NPT	0.98	5.94	1.38	4.33	2.50	2.99	2.99
2	50	2.387	2.369	1.16	6.93	2-11 1/2 NPT	1.10	6.97	1.77	4.33	3.01	3.31	3.31
3	80	3.516	3.492	1.87	9.29	3-8 NPT	1.17	9.29	2.70	7.87	4.25	4.88	4.88

Weight (LBS.)

NOMINAL SIZE		SOCKET THR'D
INCHES	mm	
3/8	13	0.22
1/2	15	0.26
3/4	20	0.55
1	25	0.88
1 1/4	32	1.21
1 1/2	40	1.32
2	50	2.20
3	80	6.61

Cv Values

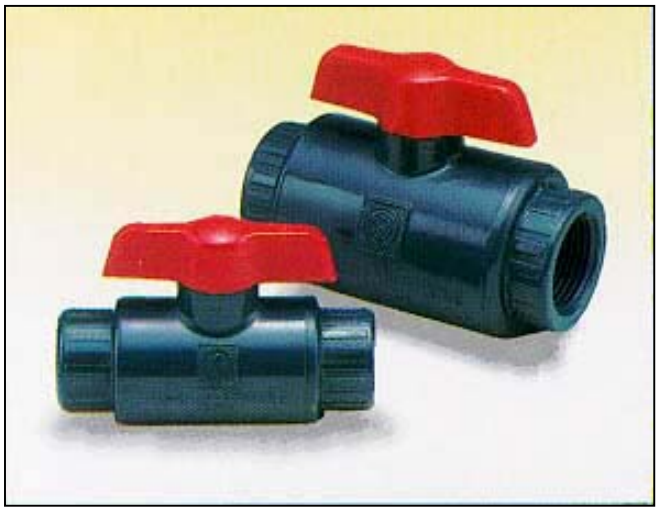
NOMINAL SIZE		Cv
INCHES	mm	
3/8	13	7.7
1/2	13	14
3/4	20	29
1	25	47
1 1/4	30	72
1 1/2	40	140
2	50	185
3	80	410

Serial No.	H – V030E – 2

Compact Ball Valves

"OMNI Ball Valves"

User's Manual



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ASAHI *AV* VALVES

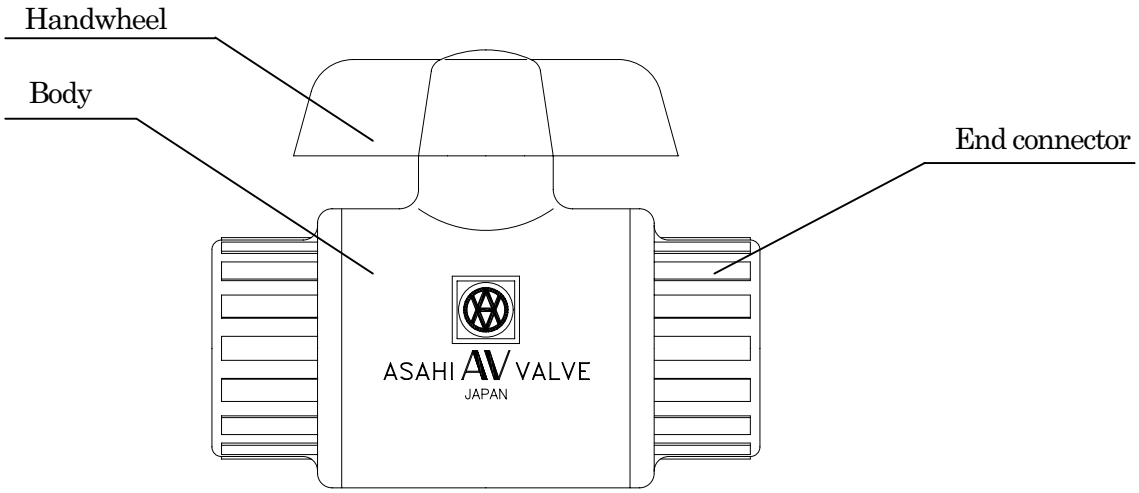
(1) General operating instructions

- Operate the valve within the pressure Vs temperature range.
  （The valve can be damaged by operating beyond the allowable range.）
- Select a valve material that is compatible with the media, refer to “CHEMICAL RESISTANCE ON ASAHI AV VALVE”. （Some chemicals may damage incompatible valve materials.）
- Do not use the valve to fluid containing slurry. (The valve will not operate properly.)
- Do not use the valve on condition that fluid has crystallized.
  (The valve will not operate properly.)
- Do not step on the valve or apply excessive weight on valve. (It can be damaged.)
- Do not exert excessive force in closing the valve.
- Make sure to consult a waste treatment dealer to dispose of the valves.
  (Poisonous gas is generated when the valve is burned improperly.)
- Allow sufficient space for maintenance and inspection.
- Keep the valve away from excessive heat or fire. (It can be deformed, or destroyed.)
- The valve is not designed to bear any kind of external load. Never stand on or place anything heavy on the valve at anytime.
- Certain liquid such as H_2O_2, NaClO, etc may be prone to vaporization which may cause irregular pressure increases, which may destroy the valve.

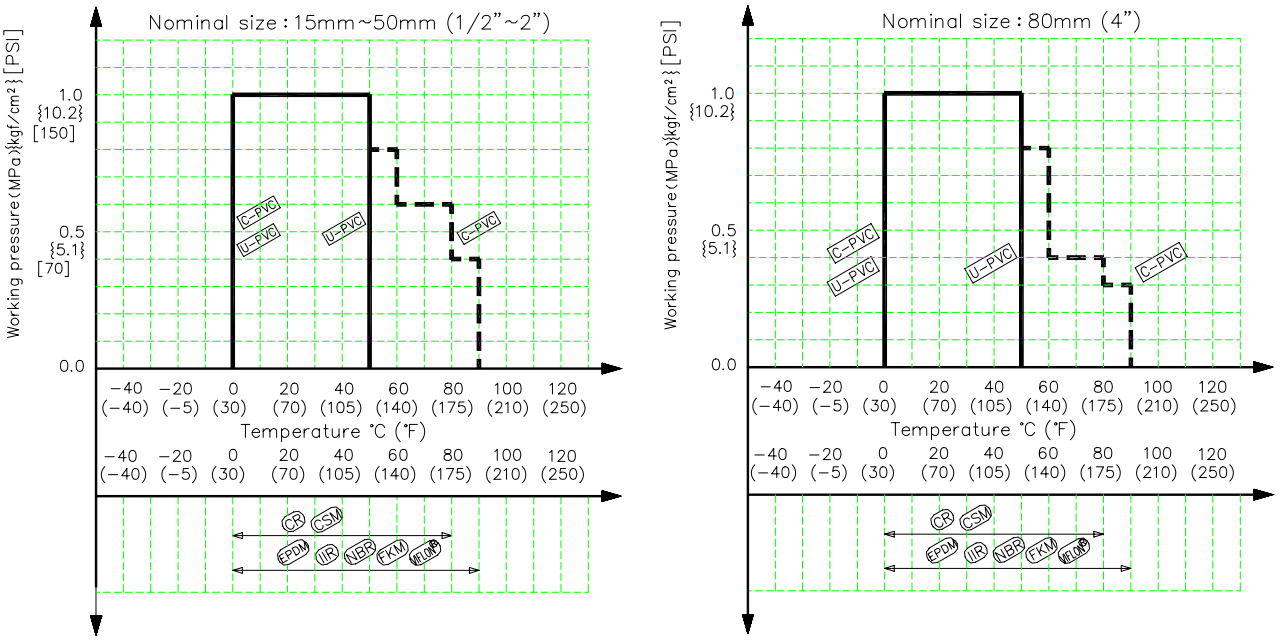
(2) General instructions for transportation, unpacking and storage

- Keep the valve packed in the carton or box as delivered until installation.
- Keep the valve away from any coal tar, creosote (antiseptic for wood), termite insecticide, vermicides, and paint. （This could cause swelling damage the valve.）
- Do not impact or drop the valve. (It can be damaged.)
- Avoid scratching the valve with any sharp object.

(3) Names or parts



(4) Comparison between working temperature and pressure



Caution

Do not operate the valve beyond the range of working temperature and pressure.
(The valve can be damaged.)

(5) Installation procedure

Threaded end

Necessary item

- Sealing tape (A non- sealing tape can cause leakage.)
- Strap wrench (Don't use a pipe wrench.)
- Spanner wrench

⚠ Caution

Make sure that the threaded connections are plastic x plastic. (Metallic thread can be damaged)

Procedure

1) Wind a sealing tape around the external thread of the joint, leaving the end (about 3mm) free.
2) Tighten the external thread of the joint and the end connector lightly by hand.
3) Using a spanner and a strap wrench, screw in the end connector by turning 180°-360° carefully without damaging it.

⚠ Caution

Avoid excessive tightening. (The valve can be damaged.)

Socket end

Necessary item

- Adhesive for rigid polyvinyl chloride pipe (PVC)
- Adhesive for heat – resistant polyvinyl chloride pipe (C – PVC)

⚠ Caution

Don't install a socket type valve where the atmospheric temperature is 5° or lower.
(The valve can be damaged.)

Procedure

1) Clean the hub part of the end connector by wiping with waste cloth.
2) Apply adhesive evenly to the hub part of the end connector and the pipe spigot.

⚠ Caution

Don't apply more adhesive than necessary.
(The valve can be destroyed due to solvent cracking.)

Adhesive quantity (guideline)

Nom. Size	13mm (3/8")	15mm (1/2")	20mm (3/4")	25mm (1")	30mm (1 1/4")	40mm (1 1/2")	50mm (2")	80mm (3")
Quantity(g)	0.8	1.0	1.3	2.0	2.4	3.5	4.8	9.0

3) After applying adhesive, insert the pipe quickly to the end connector and leave it alone for at least 60 seconds.
4) Wipe away overflowing adhesive.

(6) Operating procedure

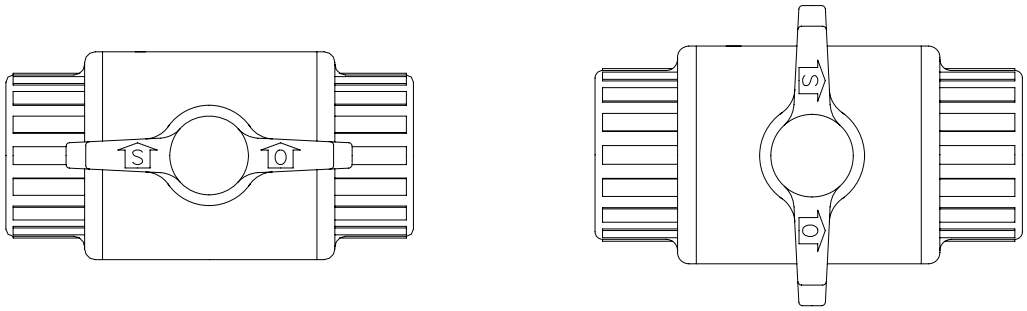
⚠ Caution

Avoid excessive tightening. (The valve can be damaged.)

○ Turn the handle gently to open or close.
(Turn the handle clockwise to close and counter clockwise to open.)

Fully closed ····· The position of the handle should be perpendicular to the pipe.

Fully opened ····· The position of the handle should be parallel to the pipe.



Full open state Full closed state

(7) Inspection items

○Inspect the following items.

(1)	Existence of scratches, cracks, deformation, and discoloring.
(2)	Existence of leakage from the valve to the outside.
(3)	Existence of leakage when the valve is opened fully at right or left.

(8) Trouble shooting

The valve is not able disassemble.

Please replace the valve to new complete another valve, if the trouble may be occurred in parts of the valve.

(9) Discarding remaining or waste materials

Caution

In discarding remaining or waste materials, be sure to ask a waste service company.
(Poisonous gas is generated.)

(10) Inquires

ASAHI ORGANIC CHEMICALS INDUSTRY CO., LTD.

Nobeoka Head Office : 2-5955, Nakanose- Cho, Nobeoka –City, Miyazaki- Pref. , Japan.
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Tokyo Head Office : (Furukawachiyoda Bldg.) 15-9, Uchikanda 2- Chome, Chiyoda-Ku, Tokyo, Japan.
Tel : (81) 3-3254-8177 Fax : (81) 3-3254-3474

Singapore Branch Office : 16 Raffles Quay, #40-03 Hong Leong Building, Singapore 048581.
Tel : (65) 220-4022 Fax : (65) 324-6151

Europe Representative Office : Kaiser-Friedrich-Promenade 61 D-61348 Bad Homburg v. d. H. Germany.
Tel : (49) 6172-9175-0 Fax : (49) 6172-9175-25

Shanghai Branch Office : Room 1301-P Shanghai Kerry Center, 1515 Nanjing Xi Road, Shanghai China
Tel : (21) 5298-6900 Fax : (21) 5298-6556

ASAHI /AMERICA Inc. :35 Green Street P.O.Box 653 , Malden, Massachusetts 02148 U.S.A.
Tel : (1) 781-321-5409 Fax : (1) 781-321-4421

Distributor

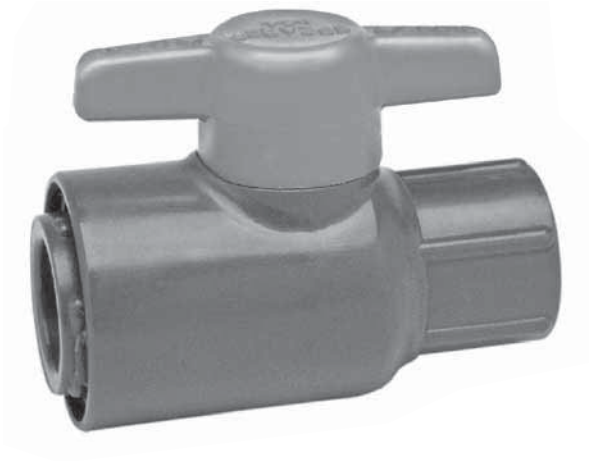
Compact Ball Valves

ASAHI *AV* VALVES

Information in this manual is subject to change without notice.

2003. 3

LAB BALL VALVES



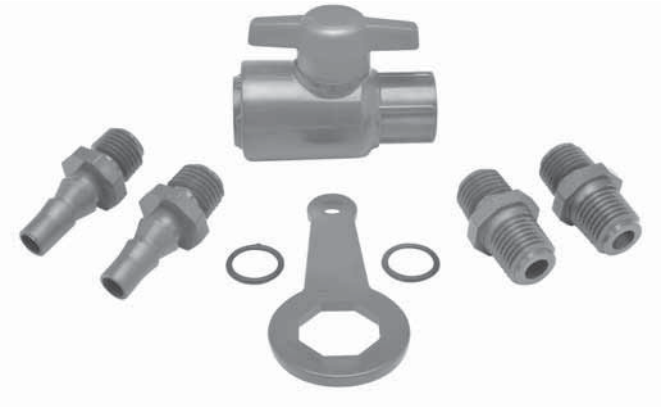
Features – PVC, CPVC

This versatile quarter-turn shutoff valve is ideally suited for a variety of laboratory, system monitoring and OEM applications. Available in IPS sizes 1/4" - 3/8" with socket or threaded end connectors, plus 1/4" threaded Valve & Adapter Kit to provide multiple connection options.

- Chemical & Corrosion Resistant PVC or CPVC Construction
- Maintenance-Free Sealed Unit
- Individual Valve or Multi-functional Valve & Adapter Kit
- Schedule 80 Full-Bore Design
- High Impact Polypropylene Handle
- EPDM or Viton® O-rings
- PTFE Floating Seat Design
- Sizes 1/4" - 3/8" Pressure Rated to 150 psi @ 73°F
- NSF Certified for Potable Water use
- Assembled with Silicone-Free, Water Soluble Lubricant

Sample Engineering Specification

All thermoplastic valves shall be sealed unit Lab type constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or Viton®. All valves shall have double stop Polypropylene handle. All 1/4" valves shall have optional field installable male thread and tubing end connector adapters. All valves shall be certified by NSF International for use in potable water service. All valves shall be pressure rated at 150 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.



LAB VALVE WITH ADAPTER KIT

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Number[1]			Pressure Rating
		Socket	Threaded	Threaded with Kit	
1/4	EPDM	1522-002	1521-002	1529-002	150 psi Non-Shock Water @ 73°F
	Viton®	1532-002	1531-002	1539-002	
3/8	EPDM	1522-003	1521-003	N/A	
	Viton®	1532-003	1531-003	N/A	

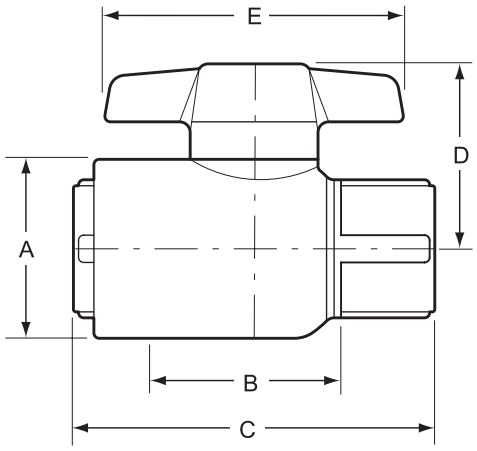
1: For CPVC Valves, add the letter "C" to part number listed (e.g., 1521-002**C**)

Valve & Adapter Kit

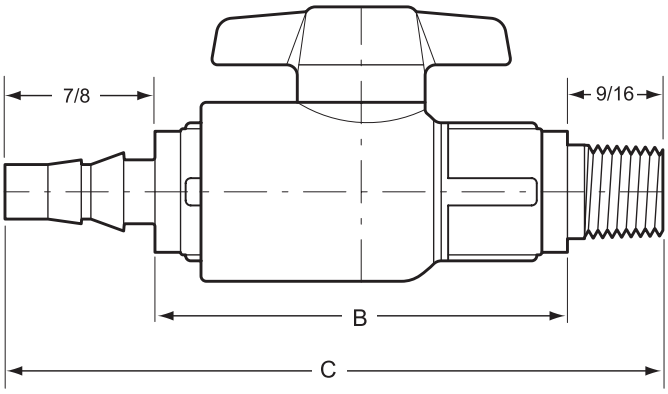
Kit allows multiple connection options. Adapters use O-ring seals for easy connection to threaded valve. Complete Kit includes:

1 – 1/4" Threaded Valve
2 – 1/4" O-ring Sealed Mpt x Mipt Adapters
2 – 1/4" O-ring Sealed Mpt x Barb Adapters (for 3/8" I.D. tubing)
2 – EPDM or Viton® O-rings (AS568A-013 size)
1 – End Connector Wrench

LAB BALL VALVES



Basic Valve



Valve with Adapter Kit

Dimensions, Weights & C_V Values

Nominal Size	Dimension Reference (inches, ± 1/16)					Approx. Wt. (Lbs.)		C_v[2] Values
	A	B[1]	C	D	E	PVC	CPVC	
1/4	1-1/16	15/16	2-1/8	1-1/16	1-3/4	.10	.11	10
1/4 w/Kit	1-1/16	2-7/16	3-7/8	1-1/16	1-3/4	.14	.15	6
3/8	1-5/16	1	2-3/16	1-1/4	2	.12	.13	24

1: Valve Lay Length
2: Gallons per minute at 1 psi pressure drop. Values calculated from valve laying length, based on derivative of Hazen-Williams equation with roughness factor of C=150.

Temperature Pressure Rating

System Operating Temperature °F (°C)		73 (23)	100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66	160 (71)	170 (77)	180 (82)	190 (88)
Valve Pressure Rating psi (MPa)	PVC	150 (1.03)	124 (.85)	100 (.69)	75 (.52)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
	CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.69)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	-0- (-0-)

NOT FOR USE WITH COMPRESSED AIR OR GASES

Y Strainers - Clear PVC

1/2″ to 2″

Features

- Clear PVC construction
- Rated to 150 PSI
- FPM Seals
- Standard 1/32″ Perf Screen
- All-Plastic Construction
- Easy Screen Access
- Can be Used in Horizontal or Vertical Position

Options

- Stainless Steel Strainer Screens

Clear PVC Construction

See how much dirt and debris have been trapped by the strainer screen in the Hayward Clear PVC Y Strainer. The translucent PVC body shows the strainer screen in operation. This helps determine when it needs cleaning based on a visual check of the amount of debris retained by the screen. These Y strainers are available in pipeline sizes up to 2″ with socket or threaded connections, and are rated at a full 150 PSI.

Economical Protection

Hayward Y Strainers protect piping system components from damage caused by dirt or debris in the process media. They cost less than other types of strainers and are light-weight and very compact. Because they can often be supported by the pipeline alone, they work in applications where other strainers cannot.

Screens for All Applications

Hayward Y Strainers are supplied with a 1/32″ perforated plastic screen. This screen is ultrasonically welded, not glued, for superior strength. Screens fabricated from type 316 stainless steel are also available in openings from 1/2″ down to super fine 325 mesh. All screens have an open area at least twice that of the equivalent pipe size cross-sectional area to minimize pressure drop.

Easy Clean Out

All sizes of Hayward Y Strainers feature a heavy-duty hex cap that permits quick and easy removal of the strainer screen when cleanout becomes necessary.

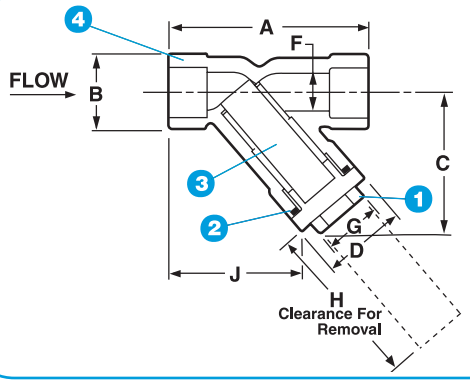
Adaptable Design

Hayward Y Strainers will work equally well in the horizontal or vertical position, simplifying piping system layout.

All Plastic Construction

Hayward Plastic Y Strainers will never rust or corrode – and they will not contaminate sensitive process media.

Technical Information



Parts List
Y Strainer

1. Cap
2. O-Ring Seal
3. Screen
4. Body

Dimensions - Inches / Millimeters

Size	A	B	C	D	F	G	H	J	Weight (lb / kg) Skt / Thd
1/2″	3.38 / 86	1.38 / 35	2.25 / 57	1.50 / 38	0.56 / 14	1.00 / 25	2.13 / 54	2.50 / 64	0.25 / .11
3/4″	4.18 / 106	1.69 / 43	2.88 / 73	2.00 / 51	0.81 / 21	1.25 / 32	2.75 / 70	3.00 / 76	0.63 / .29
1″	5.19 / 132	2.00 / 51	3.63 / 92	2.16 / 55	1.00 / 25	1.50 / 38	3.30 / 84	3.32 / 84	0.88 / .40
1-1/4″	6.63 / 168	2.63 / 67	4.50 / 114	2.94 / 75	1.25 / 32	2.00 / 51	4.50 / 114	4.45 / 113	1.75 / .80
1-1/2″	6.63 / 168	2.63 / 67	4.50 / 114	2.94 / 75	1.56 / 40	2.00 / 51	4.50 / 114	4.45 / 113	1.63 / .74
2″	7.63 / 194	3.38 / 86	5.38 / 137	3.75 / 95	2.00 / 51	2.38 / 60	5.06 / 129	4.88 / 124	3.00 / 1.4

Cv Factors*

Size	Factor	Size	Factor
1/2″	4.0	1-1/4″	12.0
3/4″	6.8	1-1/2″	28.0
1″	9.0	2″	28.0

* With 1/32″ plastic screen

Pressure Drop Calculations

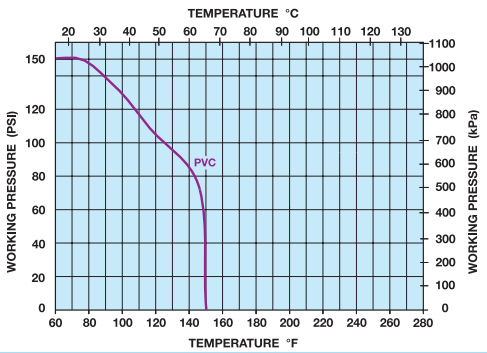
The pressure drop across the strainer, for water or fluids with a similar viscosity, can be calculated using the formula at the right:

$$\Delta P = \left[\frac{Q}{Cv}\right]^2$$

Where ΔP = Pressure Drop
Q = Flow in GPM
Cv = Flow Coefficient

The pressure loss across a valve or filter can be calculated using the system's flow rate and the Cv factor for that valve or filter.
For example, a 1″ strainer with a Cv factor of 8 will have a 4 PSI pressure loss in a system with a 16 gpm flow rate $(16 \div 8)^2 = 4$

Operating Temperature/Pressure



Selection Chart

Size	Material	End Connection	Seal	Rating
1/2″ to 2″	Clear PVC	Thd or Skt	FPM	150 PSI @ 70°F

Strainer Screen Selection

- Y Strainers are furnished with a 1/32″ perf plastic screen.
- Stainless steel strainer screens are available in these perfs: 1/32″, 3/64″, 1/16″, 5/64″, 7/64″, 1/8″, 5/32″, 3/16″, 1/4″, 3/8″, 1/2″; and in mesh sizes: 20, 40, 60, 80, 100, 200, 325.

HAYWARD INDUSTRIAL PRODUCTS
INSTALLATION OPERATION & MAINTENANCE
OF Y-STRAINER

PLEASE READ THE FOLLOWING INFORMATION PRIOR TO INSTALLING AND USING HAYWARD VALVES, STRAINERS, FILTERS, AND OTHER ASSOCIATED PRODUCTS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS INJURY.

1. Hayward guarantees its products against defective material and workmanship only. Hayward assumes no responsibility for damage or injuries resulting from improper installation, misapplication, or abuse of any product.
2. Hayward assumes no responsibility for damage or injury resulting from chemical incompatibility between its products and the process fluids to which they are subjected. Compatibility charts provided in Hayward literature are based on ambient temperatures of 70F and are for reference only. Customer should always test to determine application suitability.
3. Consult Hayward literature to determine operating pressure and temperature limitations before installing any Hayward product. Note that the maximum recommended fluid velocity through any Hayward product is eight feet per second. Higher flow rates can result in possible damage due to the water hammer effect. Also note that maximum operating pressure is dependent upon material selection as well as operating temperature.
4. Hayward products are designed primarily for use with non-compressible liquids. They should NEVER be used or tested with compressible fluids such as compressed air or nitrogen.
5. Systems should always be depressurized and drained prior to installing or maintaining Hayward products.
6. Temperature effect on piping systems should always be considered when the systems are initially designed. Piping systems must be designed and supported to prevent excess mechanical loading on Hayward equipment due to system misalignment, weight, shock, vibration, and the effects of thermal expansion and contraction.
7. Because PVC and CPVC plastic products become brittle below 40F, Hayward recommends caution in their installation and use below this temperature.
8. Published operating torque requirements are based upon testing of new valves using clean water at 70F. Valve torque is affected by many factors including fluid chemistry, viscosity, flow rate, and temperature. These should be considered when sizing electric or pneumatic actuators.
9. Due to differential thermal expansion rates between metal and plastic, transmittal of pipe vibration, and pipe loading forces DIRECT INSTALLATION OF METAL PIPE INTO PLASTIC CONNECTIONS IS NOT RECOMMENDED. Wherever installation of plastic valves into metal piping systems is necessary, it is recommended that at least 10 pipe diameter in length of plastic pipe be installed upstream and downstream of the plastic valve to compensate for the factors mentioned above.

SOCKET CONNECTION:

Socket end connections are manufactured to ASTM D2467-94. Solvent cementing of socket end connections to pipe should be performed per ASTM specifications D2855-87. Cut pipe square. Chamfer and deburr pipe. Surfaces must be cleaned and free of dirt, moisture, oil and other foreign material. Apply primer to inside socket surface of the strainer. Never allow primer or cement to contact sealing surfaces or the screen, as leaking may result. Use a scrubbing motion. Repeat applications may be necessary to soften the surface of the socket. Next, liberally apply primer to the male end of the pipe to the length of the socket depth. Again apply to the socket, without delay apply cement to the pipe while the surface is still wet with primer. Next apply cement lightly, but uniformly to the inside of the socket. Apply a second coat of cement to the pipe, and assemble the strainer to the pipe, rotating the strainer 1/4 turn in one direction as it is slipped to full depth on to the pipe. The strainer should be held in position for approx. 30 seconds to allow the connection to "set". After assembly wipe off excess cement. Full set time is a minimum of 30 minutes at 60 to 100 F. Full cure time should be based on the chart below.

JOINT CURE SCHEDULE:

The cure schedules are suggested as guides. They are based on laboratory test data, and should not be taken to be the recommendations of all cement manufacturers. Individual manufacturer's recommendations for their particular cement should be followed.

Temperature Range During Cure Period(B) °F(°C)	Test Pressures for Pipe Sizes 1/2 to 1-1/4 In.		Test Pressures for Pipe Sizes 1-1/2 to 3 In.		Test Pressures for Pipe Sizes 4 to 5 In.		Test Pressures for Pipe Sizes 6 to 8 In.	
	Up to 180 PSI (1240 kPa)	Above 180 to 370 PSI (1240 to 2550 kPa)	Up to 180 PSI (1240 kPa)	Above 180 to 315 PSI 1240) to 2170 kPa)	Up to 180 PSI (1240 kPa)	Above 180 to 315 PSI (1240 to 2170 kPa)	Up to 180 PSI (1240 kPa)	Above 180 to 315 PSI (1240 to 2170 kPa)
60 to 100 (15 to 40)	1 h	6 h	2 h	12 h	6 h	18 h	8 h	24 h
40 to 60 (5 to 15)	2 h	12 h	4 h	24 h	12 h	36 h	16 h	48 h
20 to 40 (-7 to 5)	6 h	36 h	12 h	72 h	36 h A	4 days A	3 days A	9 days A
10 to 20) (-15 to 7)	8 h	48 h	16 h	96 h	72 h A	8 days A	4 days A	12 days A
Colder than 10 (-15)	Extreme care should be exercised on all joints made where pipe, fittings or cement is below 10°F.							

A: It is important to note that at temperatures colder than 20°F on sizes that exceed 3 in., test results indicate that many variables exist in the actual cure rate of the joint. The data expressed in these categories represent only estimated averages. In some cases, cure will be achieved in less time, but isolated test results indicate that even longer periods of cure may be required.

B: These cure schedules are based on laboratory test data obtained on Net Fit Joints (NET FIT=in a dry fit the pipe bottoms snugly in the fitting socket without meeting interference).

THREADED CONNECTION:

Threaded end connections are manufactured to ASTM specifications D2464-88. F437-88 and ANSI B2.1. Wrap threads of pipe with Teflon tape of 3 to 3-1/2 mil thickness. The tape should be wrapped in a clockwise direction starting at the first or second full thread. Overlap each wrap by, 1/2 the width of the tape. The wrap should be applied with sufficient tension to allow the threads of a single wrapped area to show through without cutting the tape. The wrap should continue for the full effective length of the thread. Pipe sizes 2" and greater will not benefit with more than a second wrap, due to the greater thread depth. To provide a leak proof joint, the pipe should be threaded into the end connection "hand tight". Using a strap wrench only. (Never use a stillson type wrench) tighten the joint an additional 1/2 to 1-1/2 turns past hand tight. Tightening beyond this point may induce excessive stress that could cause failure.

FLANGED CONNECTION:

Flange bolts should be tight enough to slightly compress the gasket and make a good seal, without distorting or putting excessive stress on the flanges. Suitable washers should be used between the bolt head and flange and the nut and flange. Bolts should be tightened in alternating sequence.

RECOMMENDED FLANGE BOLT TORQUE. USE WELL LUBRICATED METAL BOLTS AND NUTS. USE SOFT RUBBER GASKETS.

FLANGE SIZE	BOLT DIA.	TORQUE FT. LBS.	FLANGE SIZE	BOLT DIA.	TORQUE FT. LBS.
1/2	1/2	10-15	2	5/8	15-25
3/4	1./2	10-15	2-1/2	5/8	20-25
1	1/2	10-15	3	5/8	20-25
1-1/4	1/2	10-15	4	5/8	20-25
1-1/2	1/2	10-15	6	3/4	30-40

INSTALLATION:

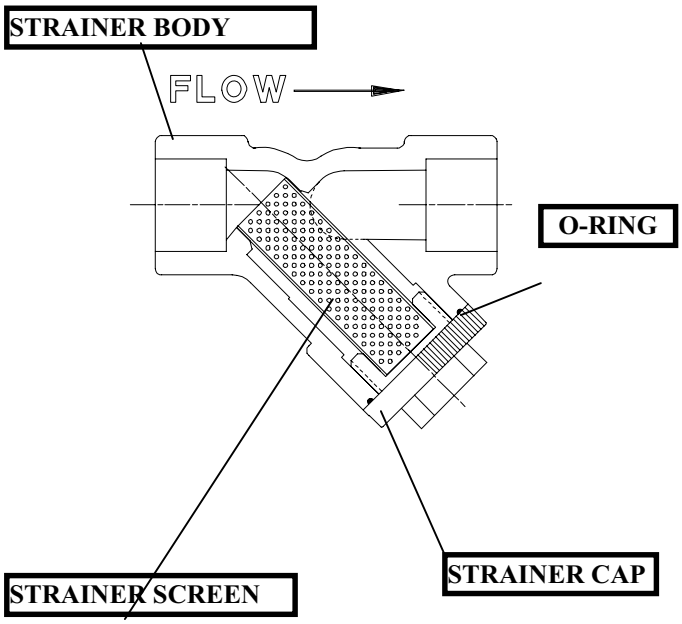
It is recommended that these strainers be installed no closer than 10 pipe diameters from a pump. At least 5 pipe diameters should be between these strainers and an elbow.

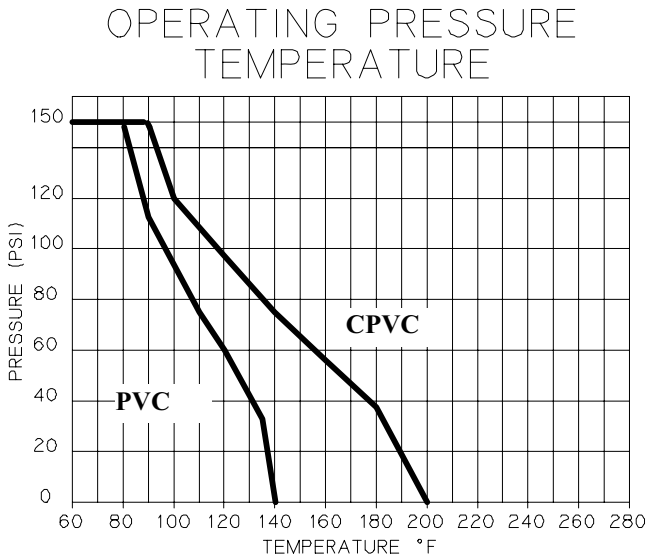
As in all plastic piping the maximum fluid velocity is 8 feet per second. This velocity minimizes the effects of valve closure and pump start up or shut down.

SCREEN CLEANING:

EXTREME CAUTION MUST BE TAKEN WHEN WORKING ON THIS STRAINER.
THE PIPING SYSTEM MUST BE DEPRESSURIZED AND DRAINED. PROPER CARE MUST BE TAKEN. CONSULT M.S.D.S. (MATERIAL SAFETY DATA SHEETS) INFORMATION REGARDING YOUR SPECIFIC APPLICATION.

When the pressure drop across the strainer is in excess of 5 PSI the screen requires cleaning. To clean the screen remove the screen cap nut from the strainer by turning counter clockwise. The collected debris should be removed with the screen. Clean the screen. **DO NOT POUND OR DEFORM THE SCREEN**. Insert the screen back into the strainer with the flange, if one is on the screen into the body first. Install the o-ring in the body groove. Use a non-petroleum base lubricant to lubricate the o-ring and thread , and re-assemble the cap to the strainer.





YSIS REV B
9/7/99
ECR 819R

Coupon Holders

Fixed (Pipe Plug) Coupon Holders

Metal Samples carries a variety of standard pipe plug coupon holders for flat and cylindrical specimens. We can design and make these assemblies to meet your specifications for size and material requirements.

Pipe Plug Assemblies for Flat Coupons

P/N	Plug Size	3" (Std.) Stem	Used with Coupon P/N
RC12E*100036	3/4" NPT	Nylon	CO102, CO117
RC13E*100036	1" NPT	Nylon	CO102, CO117
RC12Q*100036	3/4" NPT	Teflon®	CO102, CO117
RC13Q*100066	1" NPT	Teflon®	CO102, CO117
RC12E*010036	3/4" NPT	Nylon	CO100, CO103, CO115
RC13E*010036	1" NPT	Nylon	CO100, CO103, CO115
RC12Q*010030	3/4" NPT	Teflon®	CO100, CO103, CO115
RC13Q*010026	1" NPT	Teflon®	CO100, CO103, CO115
RC12E*030036	3/4" NPT	Nylon	CO118, CO120
RC13E*030036	1" NPT	Nylon	CO118, CO120
RC12Q*030036	3/4" NPT	Teflon®	CO118, CO120
RC13Q*030035	1" NPT	Teflon®	CO118, CO120
RC12E*090036	3/4" NPT	Nylon	CO105, CO106
RC13E*090036	1" NPT	Nylon	CO105, CO106
RC12Q*090036	3/4" NPT	Teflon®	CO105, CO106
RC13Q*090036	1" NPT	Teflon®	CO105, CO106
RC11E*010036	1/2" NPT	Nylon	CO100, CO103, CO115

* Add "3" to part number for Carbon Steel or "C" for PVC plug.

Pipe Plug Assemblies for Cylindrical Coupons

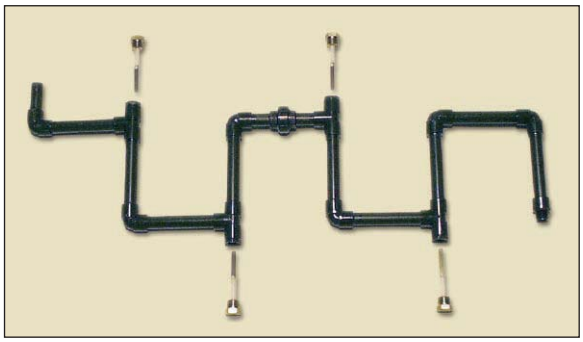
P/N	Carbon Steel Plug	Insert	# of Stems
PA2080413709	2" NPT	Nylon	8
PA2080413783	2" NPT	Teflon®	8
RC11Q3040000	1/2" NPT	Teflon®	1
RC12Q3040000	3/4" NPT	Teflon®	1
RC13Q3040000	1" NPT	Teflon®	1

All of these holders are used with ES2 series coupons.

Bypass Piping Systems

We provide conventional or custom-designed bypass systems for on-line corrosion monitoring. Commonly used in the industrial water treatment industry to determine the corrosive properties of potable or cooling water, these systems are available in PVC, carbon and stainless steels, and other materials.

Bypass systems are easily installed to your existing piping. Normally, all you need is a 1" NPT male fitting on which to attach the bypass. Standard bypass systems come equipped with 4 pipe plug assemblies, 4 pre-weighed mild steel coupons, and a 5-gpm flow control valve.



PVC SCHEDULE 80 FITTINGS

80-2-1000

Performance Engineered & Tested

SPEARS® Schedule 80 PVC fitting designs combine years of proven experience with computer generated stress analysis to yield the optimum physical structure and performance for each fitting. Material reinforcement is uniformly placed in stress concentration areas for substantially improved pressure handling capability. Resulting products are subjected to numerous verification tests to assure obtaining the very best PVC fittings available.

Full 1/4" Through 12" Availability

Spears® comprehensive line of injection molded PVC fittings offers a variety of configurations in molded Schedule 80 sizes 1/4" through 12" conforming to ASTM D 2467 and Spears® exclusive CL150 Flanges in sizes 1/2" through 16".

Exceptional Chemical & Corrosion Resistance

Unlike metal, PVC fittings never rust, scale, or pit, and will provide many years of maintenance-free service and extended system life.

High Temperature Ratings

PVC thermoplastic can handle fluids at service temperatures up to 140° F (60°C), allowing a wide range of process applications, including corrosive fluids.

Lower Installation Costs

Substantially lower material costs than steel alloys or lined steel, combined with lighter weight and ease of installation, can reduce installation costs by as much as 60% over conventional metal systems.

Higher Flow Capacity

Smooth interior walls result in lower pressure loss and higher volume than conventional metal fittings.

Additional Fabricated Configurations through 36"

Extra large, hard-to-find, and custom configurations are fabricated from NSF Certified pipe. Fittings are engineered and tested to provide full pressure handling capabilities according to Spears® specifications.

Advanced Design Specialty Fittings

Spears® wide range of innovative, improved products include numerous metal-to-plastic transition fittings and unions with Spears® patented special reinforced (SR) plastic threads.

PVC Valves

SPEARS® PVC Valve products are available for total system compatibility and uniformity; see SPEARS® THERMOPLASTIC VALVES PRODUCT GUIDE & ENGINEERING SPECIFICATIONS (V-4).

MADE IN THE U.S.A. WITH PRIDE

LPCB FIRE PREVENTION CERTIFICATION BOARD — NATIONAL ACCREDITATION OF CERTIFICATION BODIES

Quality Systems Certificate No. 293
Corporate Facilities, Sylmar, CA
Assessed to ISO 9001

Sample Engineering Specifications

All PVC Schedule 80 fittings shall be produced by Spears® Manufacturing Company from PVC Type I, cell classification 12454, conforming to ASTM Standard D 1784. All injection molded PVC Schedule 80 fittings shall be Certified for potable water service by NSF International and manufactured in strict compliance to ASTM D 2467. All fabricated fittings shall be produced in accordance with Spears® General Specifications for Fabricated Fittings. All PVC flanges shall be designed and manufactured to meet CL150 bolt pattern per ANSI Standard B16.5 and rated for a maximum internal pressure of 150 psi, non-shock at 73°F.

PVC Thermoplastic Pipe Temperature Pressure De-Rating

To determine the maximum internal pressure rating at an elevated temperature, simply multiply the pipe pressure rating at 73°F by the percentage specified for the desired temperature.

System Operating Temperature °F (°C)	73 (23)	80 (27)	90 (32)	100 (38)	110 (43)	120 (49)	130 (54)	140 (60)
PVC	100%	90%	75%	62%	50%	40%	30%	22%

NOTE: Valves, Unions and Specialty Products have different elevated temperature ratings than pipe.

Typical Material Properties

Properties	ASTM Test Method	PVC
Mechanical Properties, 73°F		
Specific Gravity, g/cm^3	D 792	1.41
Tensile Strength, psi	D 638	7,000
Modulus of Elasticity, psi	D 638	440,000
Compressive Strength, psi	D 695	9,000
Flexural Strength, psi	D 790	13,200
Izod Impact, notched, ft-lb / in	D 256	.65
Thermal Properties		
Heat Deflection Temperature, °F at 66 psi	D 648	165
Thermal Conductivity, BTU / hr / sq ft / °F / in	C 177	1.2
Coefficient of Linear Expansion, in / in / °F	D 696	3.0 x 10^{-5}
Flammability		
Limited Oxygen Index, %	D 2863	43
UL 94 Rating	94V-0	
Other Properties		
Water Absorption, % 24 hr.	D 570	.05
Industry Standard Color	White / Dark Gray	
ASTM Cell Classification	D 1784	12454
NSF Potable Water Approved	YES	

PVC Chemical Resistance

PVC is generally inert to most mineral acids, bases, salts and paraffinic hydrocarbon solutions. For more information on PVC chemical resistance refer to the Chemical Resistance of Rigid Vinyls Based on Immersion Test, published by the GEON® company.

NOT FOR USE WITH COMPRESSED AIR OR GASES

Spears® Manufacturing Company DOES NOT RECOMMEND the use of thermoplastic piping products for systems to transport or store compressed air or gases, or the testing of thermoplastic piping systems with compressed air or gases in above and below ground locations. The use of our product in compressed air or gas systems automatically voids any warranty for such products, and its use against our recommendation is entirely the responsibility and liability of the installer.

WARNING: DO NOT USE COMPRESSED AIR OR GAS TO TEST ANY PVC OR CPVC THERMOPLASTIC PIPING PRODUCT OR SYSTEM, AND DO NOT USE DEVICES PROPELLED BY COMPRESSED AIR OR GAS TO CLEAR SYSTEMS. THESE PRACTICES MAY RESULT IN EXPLOSIVE FRAGMENTATION OF SYSTEM PIPING COMPONENTS CAUSING SERIOUS OR FATAL BODILY INJURY.

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Flow-Control Orifices & Iris-Style Valves

For information about orifices, see page 479. For information about pipe size, see pages 2-3.

Pipe OD to Pipe Size Conversions

Pipe OD	3/8"	1/2"	5/8"	3/4"	1"	1 3/8"	1 5/8"	1 7/8"	2 3/8"	3 1/2"
Pipe Size	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"

Acetal Instant Tube-Fitting Orifices

Tube × NPT Male

Tube × Tube

- Maximum Pressure: Not rated
- Temperature Range: Not rated

Instant (push-to-connect) fittings seal on the outside of tubing for a quick connection. Use these orifices to control flow anywhere in your tubing system. Orifices have an acetal body with a brass insert. Release ring is acetal with stainless steel teeth. O-ring seal is Buna-N. Color is gray. **Connections:** See table.

To Order: Please specify orifice diameter: 0.016", 0.018", 0.020", 0.021", 0.023", 0.024", 0.025", 0.026", 0.028", 0.029", 0.032", 0.033", 0.035", 0.038", 0.040", 0.042", 0.047", 0.052", 0.055", or 0.063".

For Tube OD	Pipe Size		Each
Tube × NPT Male			
3/16"	1/8"	6349T11	$10.71
1/4"	1/8"	6349T12	10.71
1/4"	1/4"	6349T13	13.57
3/8"	1/4"	6349T14	11.29
3/8"	3/8"	6349T15	11.29
1/2"	3/8"	6349T16	11.29

For Tube OD	Pipe Size		Each
Tube × NPT Male (Cont.)			
1/2"	1/2"	6349T17	$11.29
Tube × Tube			
3/16"	—	6349T41	10.71
1/4"	—	6349T42	10.00
3/8"	—	6349T43	11.29
1/2"	—	6349T44	11.29

Acetal Check Valves with Instant Tube Connections

Inline

90° Elbow

Inline, Tube × Tube Connections
- Maximum Pressure: 145 psi @ 68° F
- Cracking Pressure: 0.29 psi
- Temperature Range: 34° to 159° F

90° Elbow, Tube × NPT Male Connections
- Maximum Pressure: 150 psi @ 70° F
- Cracking Pressure: Not rated
- Temperature Range: 32° to 125° F

Simply push your tubing into the end of these check valves and you're ready to go. *Note:* Cv factor is not rated.

Inline valves with tube × tube connections have an opaque white body, Type 302 stainless steel spring, and an acetal piston.

90° elbow valves with tube × NPT male connections have a black body, an adjustable screw, and an acetal seat. Mount in any position.

Connections: See table.

Connection Style	Connection Size		End-to-End Lg.	Each
Inline	1/4" Tube OD × 1/4" Tube OD	3208K14	1 15/16"	$12.21
Inline	5/16" Tube OD × 5/16" Tube OD	3208K16	2"	12.23
Inline	3/8" Tube OD × 3/8" Tube OD	3208K18	2 5/8"	12.50
90° Elbow	1/4" Tube OD × 1/8" NPT Male	3208K22	1 1/2"	14.74
90° Elbow	1/4" Tube OD × 1/4" NPT Male	3208K24	1 9/16"	16.57
90° Elbow	3/8" Tube OD × 1/4" NPT Male	3208K26	1 1/2"	16.57

Nylon Plug Orifices

- Maximum Pressure: 100 psi @ 75° F
- Temperature Range: 40° to 120° F

Insert these orifices anywhere in your line that you need to vent, bleed, and purge your system to the atmosphere at a controlled rate. Orifices have a nylon body and a polysulfone insert.

Connections: See table.

Also Available: Orifice diameters not listed. Please ask for 4926T999 and specify the connection style and orifice diameter desired.

Orifice Dia.	Color	Air Flow, scfm @ 40 psi	Water Flow, gpm @ 40 psi	10-32 Thread Each	1/8" NPT Male Each
0.004"	Purple	0.010	0.0022	4926T32 $7.26	4926T12 $8.87
0.005"	White	0.021	0.0039	4926T33 7.26	4926T13 8.87
0.006"	Red	0.031	0.0054	4926T34 7.26	4926T14 8.87
0.007"	Green	0.040	0.0076	4926T35 7.26	4926T15 8.87
0.010"	Yellow	0.083	0.0158	4926T36 7.26	4926T16 8.87
0.012"	Black	0.113	0.0215	4926T37 7.26	4926T17 8.87
0.014"	Orange	0.136	0.0272	4926T38 7.26	4926T18 8.87
0.020"	Blue	0.283	0.0560	4926T39 7.26	4926T19 8.87

Pressure-Compensating Orifices

Male × Female

Female × Female

Conserve drinking water and energy with these inline-mounted regulating control valves; they deliver consistent outlet flow over varying pressure conditions. The control mechanism is a flexible orifice that varies its effective area inversely to the applied pressure. Maximum inlet pressure is 200 psi. Temp. range is 40° to 180° F.

Brass Body Seal is Buna-N, except for 1 and 2 gpm valves, which have an EPR (ethylene propylene rubber) seal.

Nickel-Plated Brass and Type 316 Stainless Steel Bodies—*3/8" orifices* have an EPR seal, unless noted. *1/2", 3/4", and 1" orifices* have a Buna-N seal, unless noted.

Zinc-Plated Steel Body—Seal is Buna-N, except for 1 and 2 gpm orifices, which have an EPR seal.

Connections: NPT male and NPT female. See table.

To Order: Please specify outlet flow from those listed.

Pipe Size	Available Outlet Flow, gpm	O'all Lg.		Each
Brass Body—*Male Inlet × Female Outlet*				
3/4"	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	1 1/2"	8105K11	$38.09
Nickel-Plated Brass Body—*Female Inlet × Female Outlet*				
3/8"	0.13, 0.19, 0.25, 0.35, 0.50, 0.75, 1	1 3/4"	4762K41	30.16
1/2"	1, 1.5, 2, 2.5, 3, 3.5, 4, 5, 6	1 15/16"	4762K43●	35.11
3/4"	1, 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10	2 3/4"	4762K45■	36.92
1"	1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30	2 3/4"	4762K47■	73.28
Zinc-Plated Steel Body—*Male Inlet × Male Outlet*				
1 1/4"	1, 2, 3, 5, 6, 8, 10, 15, 30	3"	8107K31	81.91
Zinc-Plated Steel Body—*Male Inlet × Male Outlet (Cont.)*				
1 1/2"	1, 2, 3, 5, 6, 8, 10, 15, 30	3"	8107K33	$90.43
Type 316 Stainless Steel Body—*Female Inlet × Female Outlet*				
3/8"	0.13, 0.19, 0.25, 0.35, 0.50, 0.75, 1	1 3/4"	4762K51▲	156.38
1/2"	1, 1.5, 2, 2.5, 3, 3.5, 4, 5, 6	1 15/16"	4762K53●	188.78
3/4"	1, 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10	2 9/32"	4762K55■	246.88
1"	1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30	2 3/4"	4762K57■	274.99

● 1.5 gpm orifice has an EPR seal. ■ 1 and 2 gpm orifices have an EPR seal. ▲ 0.35 gpm orifice has a Buna-N seal.

Iris-Style Flow-Control Valves

Iris-style valves give you adjustable control and shut-off of free-flowing bulk materials such as packaging, powders, and grain. The handle rotates 180° to vary the size of the valve opening and twist-locks in any position. Body is aluminum and the control ring is bronze.

Standard valves have a nylon sleeve. Maximum temperature is 230° F. ***FDA-compliant valves*** have a urethane-coated nylon sleeve. Maximum temperature is 180° F.

Sleeve Dia.	Housing Dia. × Thick.	Standard Each	FDA Compliant Each
4"	6" × 1 1/4"	8153K11 $418.75	8153K12 $456.25
6"	9 1/8" × 1 3/8"	8153K13 478.12	8153K14 518.75
8"	11 1/8" × 1 3/8"	8153K15 584.38	8153K16 634.38
10"	13 1/2" × 1 5/8"	8153K17 $814.06	8153K18 $906.25
12"	16" × 1 3/4"	8153K19 1137.50	8153K21 1193.75